

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Cancelled)

2. (Previously Presented) The machine cell of claim 49, further including an upper gate for holding the second metal panel, said upper gate movable between a raised position away from said lower nest and an engaged position near said lower nest with said lateral access to said material-contacting area being maintained.

3. (Previously Presented) The machine cell of claim 49, wherein said vacuum system further includes a plenum and at least one fluid line connecting said plenum to said elongated channel.

4. (Original) The machine cell of claim 3, wherein said vacuum system further includes a fluid line for fluidly connecting said plenum to a vacuum source.

5. (Currently Amended) The machine cell of claim 49, wherein said lower nest further includes an alignment mechanism for aligning the second metal panel to the first metal panel to the nest periphery.

6. (Previously Amended) The machine cell of claim 5, wherein said alignment mechanism further comprises a pair of crowders, each of said pair of crowders including a pivoting alignment finger.

7. (Original) The machine cell of claim 2, further including means for moving said upper gate relative to said lower nest.

8. (Original) The machine cell of claim 2, wherein said upper gate includes at least one contact support shaft.

9. (Original) The machine cell of claim 2, wherein said upper gate includes three spaced-apart contact support shafts.

10. (Original) The machine cell of claim 8, wherein said at least one contact support shaft includes a contact plunger for contacting the second metal panel.

11. (Original) The machine cell of claim 10, wherein said contact plunger includes a spring-loaded nose.

12. (Previously Amended) The machine cell of claim 8, wherein said at least one contact plunger support shaft includes an alignment pin capable of engaging an alignment hole formed in the second sheet material.

Claims 13-21 are cancelled

22. (Currently Amended) The machine cell of claim 50, wherein said elongated ~~cavity~~ channel is disposed within said frame.

23. (Previously Presented) The machine cell of claim 50, further including at least one alignment mechanism fitted to said frame.

24. (Previously Presented) The machine cell of claim 50, further including a central support disposed within said elongated cavity.

25. (Cancelled)

26. (Previously Presented) The machine cell of claim 50, wherein said frame further comprises a second material contacting surface offset from said first material contacting surface relative to said base.

27. (Previously Presented) The machine cell of claim 50, further including a forming tool, said forming tool being operative to effect forming of at least one of the first sheet material or the second sheet material.

Claims 28-31 are cancelled

32. (Previously Presented) The machine cell of claim 49 wherein said vacuum pad further comprising a support member disposed within said elongated channel and having a sealing surface defined to substantially conform to an interior region of the first sheet material.

33. (Cancelled)

34. (Previously Presented) The machine cell of claim 50 further including an upper gate for holding the second metal panel, said upper gate movable between a raised position away from said lower nest and an engaged position near said lower nest with said lateral access to said material-contacting area being maintained.

35. (Previously Presented) The machine cell of claim 34, further including means for moving said upper gate relative to said lower nest.

36. (Previously Presented) The machine cell of claim 34, wherein said upper gate includes at least one contact support shaft.

37. (Previously Presented) The machine cell of claim 34, wherein said upper gate includes three spaced-apart contact support shafts.

38. (Previously Presented) The machine cell of claim 37, wherein at least one of said three spaced-apart contact support shafts includes a contact plunger for contacting the second sheet material.

39. (Previously Presented) The machine cell of claim 38, wherein said contact plunger comprises a housing slidably supporting a spring-loaded nose.

40. (Previously Presented) The machine cell of claim 38, wherein at least one of said three spaced-apart contact support shafts includes an alignment pin capable of engaging an alignment hole formed in the second metal panel.

41. (Previously Presented) The machine cell of claim 50, wherein said vacuum system further comprises a plenum and a fluid line connecting said plenum to each of said elongated channels.

42. (Previously Presented) The machine cell of claim 41, wherein said vacuum system further comprises a vacuum source in fluid communication with said plenum.

43. (Previously Presented) The machine cell of claim 50, wherein said lower nest further includes an alignment mechanism for aligning the upper sheet material to the lower sheet material.

44. (Previously Presented) The machine cell of claim 43, wherein said alignment mechanism comprises a pair of crowders, each of said pair of crowders including a pivoting alignment finger.

Claims 45 and 46 are cancelled

47. (Previously Presented) The method of claim 52 further comprising aligning said first metal panel on said frame prior to evacuating said sealed elongated channel.

48. (Currently Amended) The method of claim 52 further comprising aligning said second metal panel on said first metal panel prior to ~~evacuating~~ operating said tool.

49. (Previously Presented) A machine cell for forming a body panel by joining of a first metal panel to a second metal panel, the machine cell comprising:

- a lower nest including a frame and an upper surface defined to substantially conform to a perimeter region of the first metal panel, the upper surface having a generally flat material-contacting area extending to a boundary of the upper surface to enable unobstructed lateral movement of a forming tool from the material-contacting area across the boundary;

- a vacuum pad supported by said frame adjacent to a portion of said material-contacting portion, said vacuum pad having a sealing surface defined to substantially conform to an interior region of the first metal sheet and an elongated channel formed therein;

- a vacuum system to enable fluid communication between a vacuum source and said elongated channel for selectively evacuating said elongated channel;

wherein said vacuum pad and said vacuum system are operable to generate a downward clamping force sufficient to laterally immobilize the first metal sheet

during an operation clinching together the first metal panel and the second metal panel.

50. (Previously Presented) A machine cell for forming a body panel by joining of a first metal panel to a second metal panel by a forming tool, the machine cell comprising:

a lower nest including a frame and an upper surface defined to substantially conform to a perimeter region of the first metal panel, the upper surface having a generally flat material-contacting area extending to a boundary of the upper surface to enable unobstructed lateral movement of the forming tool from the material-contacting area across the boundary;

a plurality of pads supported by said frame, each of said plurality of pads located adjacent to a portion of said material-contacting portion and having a sealing surface defined to substantially conform to an interior region of the first metal panel and an elongated channel formed therein;

a vacuum system to enable fluid communication between a vacuum source and said elongated channel for selectively evacuating said elongated channel;

wherein said plurality of pads and said vacuum system are operable to generate a downward clamping force sufficient to laterally immobilize the first metal sheet during an operation clinching together the first metal panel and the second metal panel.

51. (Previously Presented) A machine cell for forming a body panel by joining of a first metal panel to a second metal panel by a forming tool, the machine cell comprising:

- a lower nest including a frame having a base and a plurality of sidewalls, each of said plurality of sidewalls extending from said base and terminating at an upper surface defined to substantially conform to a perimeter region of the first metal panel, the upper surface having a generally flat material-contacting area extending to a boundary of the upper surface to enable unobstructed lateral movement of the forming tool from the material-contacting area across the boundary;

- a plurality of pads supported on said base and located adjacent to said plurality of sidewalls, each of said plurality of pads having a sealing surface defined to substantially conform to an interior region of the first metal panel and an elongated cavity formed therein;

- a vacuum system to enable fluid communication between a vacuum source and said elongated cavity for selectively evacuating said elongated cavity;

wherein said plurality of pads and said vacuum system are operable to generate a downward clamping force sufficient to laterally immobilize the first metal sheet during an operation clinching together the first metal panel and the second metal panel.

52. (Previously Presented) A method for forming a body panel by joining of a first metal panel to a second metal panel, the method comprising:

locating a first metal panel on an upper surface of a lower nest such that a perimeter region on a first side of said first metal panel is supported on a generally flat material-contacting area of said frame and an interior region of said first side engages a pad such that a sealed elongated channel is formed between said pad and said first metal panel adjacent a portion of said material-contacting area;

locating a second metal panel on a second side of said first metal panel opposite said first side;

evacuating said sealed elongated channel to immobilize said first metal panel on said frame; and

operating a tool across the boundary of said upper surface to said material-contacting area on said first metal panel to form and flange said first metal panel over an edge of said second metal panel.